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Control/Tracking Number : 12-RC-421-AAS-DPS

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Current Date/Time : 7/19/2012 12:55:16 PM

Title:

Resonant Transneptunian Binaries: Evidence for Slow Migration of Neptune.

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Abstract:

As Neptune migrated, its mean-motion resonances preceded it into the planetesimal disk. The efficiency of capture into mean motion resonances depends on the smoothness of Neptune's migration and the local population available to be captured. The two strongest resonances, the 3:2 at 39.4 AU and 2:1 at 47.7 AU, straddle the core repository of the physically distinct and binary-rich Cold Classicals, providing a unique opportunity to test the details of Neptune's migration. Smooth migration should result in a measurable difference between the 3:2 and 2:1 resonant object properties, with low inclination 2:1s having a high fraction of red binaries, mirroring that of the Cold Classicals while the 3:2 will have fewer binaries. Rapid migration would generate a more homogeneous result.

Resonant objects observed with HST show a higher rate of binaries in the 2:1 relative to the 3:2, significant at the 2σ level. This suggests slow Neptune migration over a large enough distance that the 2:1 swept through the Cold Classical region. Colors are available for only a fraction of these targets but a prevalence of red objects in outer Resonances has been reported. We report here on ongoing observations with HST in cycle 19 targeting all unobserved Resonants with observations that will measure color and search for binary companions using the WFC3.

Category:

Centaur and trans-neptunian Objects

Additional Information (Complete):

Did you give a contributed presentation in 2010 (Pasadena)? No
Did you give a contributed presentation in 2011 (Nantes)? Yes - poster
I am willing to serve as a Chair: Yes
(1) Area of Expertise: Centaurs and trans-neptunian Objects
(2) Area of Expertise: Irregular Satellites
I have a video for Press Officer review: No
Newsworthy?: No

Status: Complete

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